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THE

OBJECT AND ORDER

OF

MEDICAL STUDIES.

BY

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IN addressing a few words of advice to the medical students of Scotland at the commencement of an academical session, there are many subjects to which we might direct their attention, such as the necessity of those habits of diligence and regularity which are so indispensable for the perfect attainment of any art or science ; the importance of the profession of Medicine in its practical, social, or political bearings ; the advantage of keeping alive that enthusiasm, and those high aspirations which constitute in youth the chief stimulus to exertion ; the consideration that our days of studentship constitute the most important epoch in our lives ; and the caution required by the conviction that, for the most part, it is then our future character as men of honour, truthfulness, and probity is formed. Hoping that all these topics will receive mature consideration, we shall content ourselves with pointing out what we believe to be the true object and order of medical studies. We are induced to do so, in consequence of having observed too many instances where an ill regulated education, a confusion in the plan of proceeding, and an unacquaintance with the distinction between what is essential and what is non-essential, has tended to retard, and even to ruin, the career of several young men who were otherwise distinguished for considerable aptitude and ability.

In the outset, then, we would especially endeavour to impress upon those we now address, one important fact, namely, that they are MEDICAL students, and that as such their ultimate object is to acquire an art, or, in other words, a knowledge of all those means by which they are qualified to minister to the prolongation of life and cure of diseases. It is not for them to become natural or moral philosophers, chemists, zoologists, or botanists, although these subjects, if wisely studied, will, by inducing habits of exact observation and sound reasoning, be of the most essential service to them as medical

practitioners. Neither is it for them to attempt the acquirement of all the knowledge that the different professors they attend, teach in their particular departments. But what is expected of them, and what they must endeavour to obtain from the whole series of studies, is such a sum of learning, and such an available kind of information, that they may undertake the serious duties of a medical practitioner with credit to themselves and advantage to the public. This is the great object, which should never be lost sight of, from the beginning to the end of their medical studies. It is true that, on many occasions, particular individuals have been led away by the attraction of some of the accessory sciences to lose sight of this object, and entirely devote themselves to Chemistry, Natural History, Botany, and so on. Of these, several have rendered their names distinguished in the annals of science. But where a strong tendency has been manifested for these special studies, it has, for the most part, been destructive to their education as medical men. These, in fact, are not the essential, but the non-essential, though, as I have said, useful departments of Medicine. Hence, why I regard with some apprehension the circumstance that, according to the new regulations in our University, the first professional examination, at the end of two years, is to be exclusively confined to Chemistry, Natural History, and Botany. Formerly, if a student was thoroughly conversant with Anatomy and Physiology, he might hope to pass his examination on the strength of knowing well these essential branches of his subject, even though his knowledge of Chemistry was very general, and that of Natural History and Botany somewhat deficient. But if the portals to a medical career are in future to be Chemistry, Natural History, and Botany; and if, in consequence of an excessive fear for examination in such subjects, the student is induced, during his two first years of study, to neglect the important subjects of Anatomy and Physiology, in order to devote an unnecessary amount of time and study to the acquisition of what must always be to him merely accessory knowledge, I apprehend great danger to the cause of Medicine. There have been great physicians and surgeons who knew little of these three subjects; but I never yet heard of a distinguished medical man who was ignorant of Anatomy and Physiology. I repeat, then, that the great object of a medical student ought to be to learn thoroughly the essential branches of his profession; and the next point we have to consider is, how this can be done efficiently.

The most important change in the regulations recently put forth for the medical student, is that which refers to the preliminary education. Examinations for medical diplomas are in future to be, not only professional, but to have reference to general culture; and, considering how necessary a good education is, for the proper knowledge and practice of Medicine as a profession, there will, I presume, be no difference of opinion as to the propriety of this. The important

thing to consider is, that such examination should in truth be preliminary to, and not coincident with, professional study. At first, some little laxity may be allowed on this point; but as a permanent rule, it ought in a short time to be rendered stringent, and for this reason:—Four years, as we shall see, form a sufficiently short period to qualify a young man for the duties of his profession; and it must be obvious that if, during that time, his mind be distracted with the necessity of learning Greek or Latin, Logic or Moral Philosophy, Mathematics or Mechanics, his general and his medical education will both suffer. The regulations laid down by the Medical Council are, that before any one be even allowed to enrol his name as a medical student, he shall have passed a matriculation examination, and before he can present himself to be examined professionally, other acquirements shall be demanded of him. Now, it is very desirable, although at first this has not been rendered compulsory, that all these matters be made *preliminary*, for the reason I have just stated. In truth, on analysing the nature of the demand so made, I find it to be little more than what a well-educated schoolboy, sixteen years of age, ought to pass with facility. It is not advisable that a professional education should commence before the age of eighteen, or at the earliest seventeen; so that ample time exists for acquiring the necessary preliminary knowledge. The matriculation examination in this University comprises English, Latin, Arithmetic, the elements of Mathematics, and the elements of Mechanics. Before the candidate can be examined professionally, he must, in addition, pass an examination in *two* of the following subjects, viz.,—Greek, French, German, Higher Mathematics, Natural Philosophy, Logic, and Moral Philosophy. Lastly, to obtain the highest degree, he *must* have passed Greek, Logic, or Moral Philosophy, and one of the following subjects, viz.,—French, German, Higher Mathematics, and Natural Philosophy. The best plan for any commencing student, therefore, is, *in addition* to the matriculation examination, to pass at once, 1st, in Greek; 2d, in either Logic or Moral Philosophy; and 3d, in one of the subjects just named, whereby he at once gets rid of all preliminary subjects, and is enabled to obtain the highest medical degree without any future disturbance to his professional study. Of the subjects left open to his choice, though all are useful, I have no hesitation in recommending Natural Philosophy, in consequence of its vast and daily increasing importance to a just comprehension of Physiology and a true theory of Medicine. If our public seminaries embrace, as they ought to do, this comprehensive education for a future professional life, I repeat, a young man ought to be prepared for such an examination on leaving school. If they do not, a year spent in preliminary study at a university, in attending two or three classes in the Faculty of Arts, so far from doing harm, will be productive of good. A more extended education, an insight into academic life, and, above all, the extra year's experience

and matured understanding, will render him better qualified to grapple with the difficulties of his professional studies.

And now with regard to these. The first duty to which every medical student should attend, is to draw out a well-considered plan of the order in which he is to study the various subjects contained in the prescribed curriculum, the hours necessary for attendance on classes, and the time at his disposal for other pursuits. This general plan, when well considered and arranged, ought to be carefully followed, although it may receive a few modifications, additions, or subtractions, as time advances, with the view of meeting particular wants or requirements in individual cases. What is especially necessary to be understood is, that a thorough knowledge of some things is essential, whilst only a general knowledge of others is necessary. The first essential subject to be studied is Anatomy. This truth, which is sure to force itself upon the student sooner or later, is unfortunately one which often fails to impress itself upon him at that time when most likely to be useful. Anatomy, indeed, is, as it were, the alphabet of his studies; it is the *sine qua non*, without which all other kinds of study are perfectly useless. Medical, like most other forms of education, consists of a series of steps, each of which must be mounted in regular succession. There must be no leaping over in this case. Hence it is necessary to be convinced that the more earnestly Anatomy is cultivated during the first year by means of lectures, reading, but above all by dissections, the more thoroughly will the student be prepared for, and the more easily will he prosecute, his subsequent studies.

But Anatomy is of different kinds: there is Descriptive Anatomy, Surgical Anatomy, General Anatomy, Comparative Anatomy, Physiological Anatomy, and Pathological or Morbid Anatomy. To this list some have added Microscopical Anatomy, from the instrument employed. But we might as well talk of a knife and forceps Anatomy. The telescope is as necessary to the astronomer as the microscope is to the physiologist, or the stethoscope to the physician. Yet it would betray a very limited knowledge of a science to speak of Telescopical Astronomy, or Stethoscopical Medicine. The truth is, Anatomy can never, properly speaking, be microscopical; the new science or branch of Physiology referring to our knowledge of the ultimate tissues, being in fact Histology. It is the more important to remember this, because the Anatomy taught from a histological or physiological point of view is not the kind of Anatomy with which the student should commence his medical studies. What he requires, and what he should carefully take care that he obtains under this term Anatomy, is the descriptive anatomy of the human body, consisting of a clear and simple systematic description of the bones, ligaments, muscles, blood-vessels, lymphatics, nerves, and viscera. Of this the student should acquire a distinct and general notion during his first year; and any course of Anatomy which fails to give it, how-

ever able in other respects it may be, is not a course which is adapted for this period of a student's studies. Professor Tiedemann, whom I attended in Heidelberg, and Professor John Müller of Berlin—the greatest of philosophical and general anatomists—whom I heard lecture in Berlin, were fully persuaded of this. They never mixed up their favourite studies with the elementary course which, as professors, they properly found it necessary to teach, as a foundation for the study of Medicine. In subsequent special courses, or in conjunction with Physiology, of which Müller was also professor, he treated fully of what may be called the higher branches of Anatomy; but for this the first year's student is quite unprepared. Such teaching must be obviously unintelligible to those who are not yet acquainted with the bones, muscles, nerves, and viscera of the body; and, indeed, can only be appreciated by those who are finishing rather than such as are commencing their studies. In the first year, therefore, I would earnestly advise the student to avoid such teaching, and only endeavour to master the great facts of the descriptive anatomy of the human body,—a task which has been proved to be amply sufficient for the greatest anatomists to teach, and is one which, I fear, is more than the most zealous student at this period is capable of acquiring.

Another important subject is Chemistry, which teaches a knowledge of the elementary composition of all the substances in nature, and of the union of such elements one with another. As Medicine progresses, the more it becomes evident that Chemistry must play a chief part in causing its advancement; but in this study, as in that of Anatomy, what the student has to master during his first year are the elementary truths of the science. Chemistry also, like Anatomy, is of various kinds, and may be directed in its applications to Arts and Manufactures, to Agriculture, to Medical Jurisprudence, to Physiology, and to Pathology. It is in the three last directions that the science is useful to the medical student, who is too apt to forget, while learning the chemistry of minerals and of manufactures, that such knowledge benefits him only in proportion as it affects animal life, the textures of man, and the alterations constituting disease. The time, I trust, will arrive when a greater stimulus will be given to Organic Chemistry in our Universities, and when not only a capability of carefully analysing the animal solids and fluids will be a common accomplishment, but when Micro-chemistry will be better studied. Then we shall be enabled to ascertain the composition of the ultimate elements of structure, and may hope to see Physiology, Pathology, and Therapeutics partake of something approaching towards, if they do not reach, the dignity of the exact sciences.

The first winter session, therefore, should be entirely dedicated to acquiring a knowledge of Anatomy and Chemistry; and for this purpose, attendance on two classes, viz., Descriptive Anatomy and Chemistry, together with dissections, are quite sufficient. In the

summer, these studies should be earnestly prosecuted practically in the dissecting-room and in the laboratory. The student also may now attend what are called Anatomical Demonstrations. By these are understood in Edinburgh a formal daily lecture in the class-room on Descriptive, Topographical, and Surgical Anatomy. In all other schools, by Demonstrations are meant the assistance, and occasional explanations of dissected parts, given to the student in the dissecting-room. I have no hesitation in saying that the system of a double course of lectures on Anatomy, given to the student during one day in Edinburgh, is an unnecessary tax upon his time and resources. I do not for a moment deny the possible value of teaching any subject twice over, according to a different arrangement. As already stated, Anatomy may be taught in a great variety of ways; and it may be easily understood that two gentlemen, teaching one in one way and another in another, or one teacher giving a systematic course in the morning, and a topographical or surgical course in the afternoon, may impart in both ways valuable information. But if, in order to cause attendance on two classes instead of one, any essential part of the descriptive course is omitted, and is purposely treated of in another course, so as to induce attendance on both, a great injury is done to the student. Every other teacher besides the anatomical one might institute double courses in the same way. The professor of Chemistry, for instance, might teach Elementary Chemistry at one hour, and Chemistry from a physiological or an agricultural point of view at another. The professor of Physiology might act in the same way; and thus the greatest confusion would be thrown into the proper arrangement of the classes, not to speak of the extra expense entailed on the student. I repeat, then, that what is essential for the commencing student is a course of *Descriptive Anatomy*, with dissections and demonstrations *in the dissecting-room*. A daily lecture, occupying six months, under the name of Demonstrations, is wholly unnecessary, although such lectures may be indulged in in summer, if the student thinks he can obtain advantage from them, and then only. It should be understood that the course of Demonstrations, as given in Edinburgh, is not required by any of the Medical Boards, and that what is understood by Demonstrations by the London and other corporations, is simply what is called in Scotland "Practical Anatomy," including demonstrations by the assistant in the dissecting-room.

During the first summer session, either Botany or Natural History must be attended; care being taken that these agreeable studies do not interfere with the all-important subject of Anatomy, which should be energetically pursued, in order that preparation be made for the next step in medical education.

There seems to be a principle in the human mind which seeks for a rational causation, or an explanation of the phenomena it observes; and hitherto we have supposed the student to have been busied with

anatomical and chemical facts. He has next to ascertain the theory or generalizations which are derivable from them. This constitutes the course of the Institutes, which comprises a systematic consideration of Histology, Physiology, and some parts of Pathology. We need not dwell upon the necessity of theory; for the mind, and especially the young mind, is only too prone to rush into it. It is not so much theory itself, as *correct* theory—that is, theory which embraces all known facts—that is so much to be desired. Indeed, nothing is more necessary than early to acquire the habit of checking rash speculation, and that proneness to crude and imperfect hypothesis, which characterizes the infancy of knowledge in the early history of the world, as well as in the early history of each individual. It is in this point of view that we may hope to find the extended preliminary education will be of such value to the future progress of Medicine, including as it does, not only literary but scientific education, assisted by Logic, Mathematics, Moral Philosophy, and Natural Philosophy, with all of which the Physiology of the present day is intimately associated.

During this second year he must also attend Systematic Surgery, and thus obtain a general notion of external diseases. In doing so, he will observe how necessarily operations on the body are connected with a knowledge of Anatomy; and this study, having been hitherto descriptive and topographical, ought now to be directed by a surgical aim. Thus everything depends upon the manner in which the first year has been spent; for, if Anatomy be wanting, surgical details cannot be understood, and the result will be, that, instead of the attention being concentrated chiefly on the study of Physiology, and obtaining just views of function, the mind will be perplexed, an attempt will be made now to learn the facts that ought to have been already mastered, the ideas of theory will be vague and confused, and at the end of the session, instead of being ready to take advantage of the summer three months, the student will find it necessary to pause, or even to retrograde, in the prescribed course.

During the second summer Botany or Natural History should be attended; and, in doing so, the student should resolve on making himself master at this time of as much of either of these sciences as he can accomplish.<sup>1</sup> Here, again, if he has made himself tolerably acquainted with the general laws of Physiology in the course of the previous session, he will readily perceive how either subject bears upon his general course of study. Whilst attending Botany or Natural History he should assiduously extract from the lectures all the facts and sound theory he can, and add them to his store of knowledge, placing them, however, amongst the useful but non-essential parts of study.

<sup>1</sup> It is a matter of no importance whether Botany or Natural History be attended first; but it is of great consequence to the comfort and general advantage of the student that they be not studied at the same time.

Botany is, fortunately, taught at such an hour that it cannot interfere with any of the essential branches of a medical education; but not so with regard to Natural History. This has recently been professed at an hour when it materially interferes with clinical instruction in the hospital. If, indeed, the student follows the course during the first or even the second year of his studies, as he ought to do, this perhaps is not so great an evil; but when, as too frequently happens, an advanced student from other schools, where no Natural History is required, finds himself compelled by the regulations of the University to attend this class, and is thereby prevented from obtaining that precious and essential knowledge which he can only acquire in an hospital, the injury to medical education is most flagrant, and should certainly not be tolerated. I have known gentlemen from other schools, nay, even practitioners advanced in life, who at a great sacrifice have spent one year in this University to qualify themselves for a degree, been obliged to leave the bedside of the sick, suspend the taking of notes and the study of diseases, forego the possibility of seeing a single *post-mortem* examination during an entire session,—and all this because it has been determined that Natural History, in which perhaps he takes little interest, shall be learned at an hour when hospital instruction is in truth most essential. If this system be continued, attendance on Natural History becomes an evil rather than a benefit. I think every medical student is the better for having had his attention directed to Natural History, and to the general truths of Meteorology, Geology, and Zoology. But if this is only to be obtained by giving up attendance on an hospital, and the practical acquaintance with Morbid Anatomy in the dead-room, such knowledge is acquired at too great a sacrifice.

During the second summer, also, he should commence, if he have not previously done so, attendance on the hospital; enter the course of Clinical Surgery; once more pursue Practical or Analytical Chemistry in the laboratory; and, if he can, occupy some hours in dissection, of which it is impossible to have too much, as thereby he will keep up his knowledge of Anatomy.

We now arrive at the third year in medical education, and at what may be called the third essential step in the student's onward progress. This consists in directing his chief attention to hospital practice. Many Scotch students, indeed, first enter an hospital at this time; but we cannot too urgently advise them to take out a perpetual ticket for hospital attendance at the commencement of their studies. Not that during the first two years the tyro should make it a principal subject of attention, or allow it to interfere with his practical studies in Anatomy or Chemistry; but that he may have the right of entering the wards, of habituating himself to the sight of disease, of seeing important operations, and so gradually and insensibly preparing himself for the future. It is at the com-

mencement of the third year, however, that hospital study should assume the chief place in his system of education; and he will be wise never to let it afterwards hold an inferior position. His object in attending an hospital should be, while perfecting himself in observation, while extending his knowledge of facts, and connecting them with the principles he has acquired, to obtain what is called experience and practical tact—a kind of knowledge that cannot be obtained from books or lectures, and is only to be acquired at the bedside. Its value cannot be too highly estimated; because, as the theory or science of Medicine is imperfect, its shortcomings and redundancies can only be remedied by continual observation and experiment, such as the wards of an hospital present us with. Now, therefore, the student should commence the serious study of disease, at first in the surgical wards, where it is external, and directly presented to the sight or the other senses; and, secondly, in the medical wards, where it is internal, and more a matter of inference and correct reasoning. But whilst engaged in acquiring experience, the knowledge of facts and theory should be kept up and extended by again attending Physiology and the class of *Materia Medica* and Therapeutics, which, with Surgery, should constitute now the chief subjects of study, especially Clinical Surgery, and carefully watching surgical cases in the hospital. In addition, a systematic course of the Practice of Physic should be attended; without, however, at this time doing more than deriving from it a general knowledge of internal diseases. In short, during this third year, the student should take care to add to his previous knowledge a thorough acquaintance with Physiology and a good knowledge of Surgery and the *Materia Medica*.

During the third summer session, the student should commence the study of Clinical Medicine; pay attention to dispensary practice; continue his attendance on the hospital wards, surgical or medical, according to the nature of his requirements; and attend one or more of those special classes which are found in every great school of medicine, especially Histology, Operative Surgery, and Ophthalmology. Histology and the use of the Microscope, including what has often been called *General Anatomy*, should at this time receive special attention. Every year proves its importance more and more, not only as a means for arriving at just conclusions in Medicine, but for determining essential points in the detection and treatment of diseases.

The fourth and last year should be entirely devoted to practical studies, the chief being Clinical Medicine and Midwifery, with careful observation of cases in the medical wards. In summer the course of Medical Jurisprudence must be followed. The student should also again attend the dispensary; treat cases for himself, under the eye of a good practitioner; and pay attention to Practical Midwifery. During all this time, while extending his powers of observation and

his experience, theory should be advanced to its farthest limits by the acquirement of a true pathology. At this time one of the most important subjects to attend to is Morbid Anatomy, as studied at *post-mortem* examinations; for, if Descriptive Anatomy be useful to surgeons, Morbid Anatomy and General Pathology are infinitely more useful to physicians. Indeed, considering how few operations any one student may have occasion to perform, while every practitioner, whatever be the sphere of his practice, has to treat alterations in the structure of various tissues and organs, the importance of Morbid Anatomy cannot be too strongly urged. Moreover, there are few medical men who are not at some time called upon to open a dead body, and report upon the morbid appearances observed, in reference to some legal investigation. His power of discharging this duty well, will entirely depend upon his previous experience in Morbid Anatomy, on having seen many well-conducted *post-mortem* examinations, and on having carefully handled and examined the diseased parts. Not only may his reputation among his fellow-citizens be gravely affected by his conduct on such an occasion; but the vindication of innocence or the detection of guilt, the lives of the accused, and the satisfactory accomplishment of numerous judicial inquiries, may hang upon his correct judgment. How culpable, therefore, the man who, knowing his future responsibilities in these things, habitually neglects the *post-mortem* examinations of a large hospital!

During this last year of study, perhaps there is no one thing which a medical student should more assiduously practise himself in, than making careful records or histories of those cases which he himself sees under treatment in the medical wards of an hospital. For this purpose he ought constantly to carry a note-book with him, in which he should enter methodically all the facts of every new case that enters, the prescriptions for treatment, and all the changes which may subsequently occur, including the results of *post-mortem* examinations. The taking such notes not only impresses facts on the mind, but imperceptibly induces more careful habits of observation, and more accurate powers of reasoning with regard to them—it converts what would otherwise prove merely a monotonous duty into a study of great interest; whilst the cases themselves will constitute in after life not only a pleasing memorial of hours well employed, but may often be consulted with advantage when more experience has been subsequently acquired in medical practice. Most medical men who have attained eminence in their profession have, at an early period of their lives, been great case-takers.

In addition to those branches of instruction which are considered imperative, some students will further avail themselves of special classes, according as their time and means allow, and in pursuance of the particular direction in which their intended practice points. Thus, in most of the large schools of medicine throughout Europe,

there will be found extra means of becoming practically acquainted at this time with Auscultation, Histology, Pathological Anatomy, Insanity in a well-conducted asylum, etc., etc.; and such special courses are calculated to give a greater impulse to individual study, and render it more perfect than may at first sight be imagined.

In the sketch of medical education now given, it has been our endeavour to point out that there are three essential parts:—1st, facts; 2d, theory; and 3d, experience. It is by the combination of these three divisions of knowledge—by an appreciation of the advantages to be derived from each—by correcting the faults inherent in one by proper application of the others, that the student may be expected at length to obtain just views of the science and art of Medicine. He will, we trust, also see the importance of studying these three divisions in their proper order. Indeed, on this point there can be no doubt or difference of opinion. For if any one attempt to master theory without an acquaintance with facts, or endeavour to profit by experience without any general notions of health or disease, we need scarcely say that very gross ignorance and professional incompetency must be the result. Indeed, it is to the imperfect education, arising from undue attention to one or more of these subjects, from a limited acquaintance with facts, or from a too theoretical disposition uncontrolled by experience, that we may ascribe the ridiculous doctrines which have originated among ignorant practitioners, and been spread amongst a still more ignorant and credulous public. To the student, order and method at the commencement will save him time and labour. How often have we seen a student, in his fourth and last year, instead of zealously deriving benefit from hospital attendance, and feeling interested in the *post-mortem* examinations, deserting the wards and pathological theatre, in order to follow some elementary course of Anatomy, or of Chemistry! He feels convinced, too late, that what *must* be done, had better have been accomplished long before, and that, in order to acquire elementary knowledge, he is under the necessity of sacrificing that precious experience which he may never again have the opportunity of obtaining. I trust the observations now made, will at least guard my young friends from this danger, and impress upon them the importance of acquiring, in their proper time and order, elementary facts, correct theory, and personal experience. We would say to them,—Determine from the first to employ your faculties honestly in the acquirement of sound instruction. Let your aim be directed to a thorough knowledge of your responsible profession, and you will have nothing to fear from examinations. Above all, avoid those attempts to burden the memory, and those artificial systems of acquiring a parrot-like information, into which the base and interested endeavour to entrap the unwary.

A mind so educated and regulated will not be likely to go astray, and its possessor, while alive to the necessity of following the progress of the science and art of Medicine, will in this manner best learn, amidst the multitude of suggestions, the number of theories, and the opposing statements that may perplex him, to reject what is worthless, and only adopt what is truly useful. He will despise the miserable vanity of announcing what is new, without a scrupulous regard to its being correct. He will, while retaining the right of thinking boldly for himself, not forget that observation is difficult, theory imperfect, and experience fallacious. He will not, therefore, rashly substitute his own authority for that of those whose knowledge is more extensive, or commit himself to the ephemeral doctrines of the day, by which a few otherwise respectable men have lost their professional reputation. He will remember that the conclusions of youth are almost always modified by the experience of age, and that the wisest and most eminent men of science have given the best proofs of a solid understanding by the readiness with which they have acknowledged their own ignorance.

In conclusion, I have only to say, that the order of medical study here recommended, seems to me the best applicable for the student in Scotland, who dedicates four years to the acquirement of sound professional knowledge. But where the time allowed is longer, or when it is important to pass the examination of a special Board which has issued imperative regulations as to the order, as well as the subjects of study, care must be taken to regulate the course of education accordingly.